*APPENDIX **5***

COMMERCE CONTROL LIST ITEMS (CCLIs)

A. GENERAL. CCLIs are dual use (military, commercial and other strategic uses) items under the jurisdiction of the Bureau of Export Administration, U.S. Department of Commerce, through the Export Administration Regulations. The types of items under the CCL are commodities (i.e., equipment, materials, electronics, etc.), software and technology. The CCL does not include those items exclusively controlled by another department or agency of the U.S. government. These commodities are controlled for reasons of National Security, anti-terrorism, chemical and biological weapons, crime control, missile technology, nuclear nonproliferation, short supply (resource assessment), and regional stability. DoD Item/Technical Managers/Equipment Specialists will assign a demilitarization code "Q" to these items if they fall outside the criteria of an MLI.

NOTE: The USML always takes precedence over the CCL. This Appendix and the related EAR will be used only when an item does not meet the criteria of an MLI.

B. COMMERCE CONTROL LIST (CCL). This Appendix contains the CCL, as excerpted from 15 CFR 774. This list is included for general guidance in identifying commodities which may be CCLIs. Final determination must be based on a review of the specific commodity interpretations in 15 CFR 730-774, and a commodity listed in this section must not be construed as all inclusive.

C. EXPORT ADMINISTRATION REGULATIONS (EAR). The EAR is updated several times annually with publication of Export Administration Bulletins and a complete printing is available annually. Paper copy or electronic versions are available. To obtain a copy of the EAR and all subsequent Export Administration Bulletins, contact the National Technical Information Service (NTIS), (703)487-4630 or FAX (703)321-9467.

COMMERCE CONTROL LIST - INDEX

(NOTE: The designation "(R)" indicates that the commodity is referred to in the ECCN cite)

Engines, aero gas turbine not under 9A001 or 9A101, software	***9D991***
Engines, aero gas turbine not under 9A001 or 9A101, technology	***9E991***
Engines n.e.s., aircraft	***9A991***
Engines n.e.s., aircraft, software	***9D991***
Engines n.e.s., aircraft, technology	***9E991***
Engines n.e.s., diesel	***9A990***
Engines n.e.s., diesel, software	***9D990***
Engines n.e.s., diesel, technology	***9E990***
Engines n.e.s., gas turbine	***9A991***
Engines n.e.s., gas turbine, software	***9D991***
Engines n.e.s., gas turbine, technology	***9E991***
Engines n.e.s., submarine	***8A994***
Engines n.e.s., submarine, software	***8D993***
Engines n.e.s., submarine, technology	***8E993***
Engines n.e.s., marine (inboard and outboard)	***8A994***
Engines n.e.s., marine (inboard and outboard), software	***8D993***
Engines n.e.s., marine (inboard and outboard), technology	***8E993***
Environmental chambers, capable of simulating flight	***9B106***
Epitaxial growth equipment	***3B001***
Epitaxial wafers, Cadmium telluride (CdTe)	***6C002***
Erbium oxide (erbia) (Er_2O_3) made/coated crucibles	***2A225***
Ethers (alkylphenylene) in the form of a lubricating fluid	***1C006***
Ethyl phosphinyl dichloride/difluoride	***1C350***
Ethyl phosphonyl dichloride/difluoride	***1C350***
0-Ethyl-2-diisopropylaminoethyl methylphosphonite (QL)	***1C350***
Exchanges, telecommunications	***5A001***
Excimer lasers	***6A005***
Expert systems integration software development/numerical control technology	***2E003***
Expert systems software	***4D003***
Exploding bridge (EB)/bridge wire (EBW) detonators, foil initiators (EFI),	***3A232***
Explosive detection systems,	***2A993***
Explosive detonators, industrial electric	***3A232***
Explosive, high (industrial)	***1C018***
Explosive/munitions environment handling robots	***2B007***
External amplifiers for oscilloscopes	***3A202***
FADEC (Full authority digital electronic engine)	***9D003***
FPGA's (Field programmable gate arrays)	***3A001***
FPLA's (Field programmable logic arrays)	***3A001***
Fabric lined journal sliding bearings	***2A006***
Fast Fourier Transform (FFT) processors	***3A001***
Fast fourier transfer processors, acoustic signal processing	***6A001***
Fast select packet routing/switching capability, equipment	***5A001***
Fast switching function modules or assemblies	***3A228***
Fault tolerance FADEC software	***9D003***
Fault tolerant digital computers	***4A003***
Fermenters, biological processing	***2B352***
Fiber optic cable	***5A001***
Fiber optic hull penetrators/connectors	***8A002***
Fiber optic image inverters	***6A002***
Fiber optic magnetometers	***6A006***
Fiber optic wave devision multiplex equipment	***5A001***
Fiber surface treatment equipment	***1B101***
Fibrous or filamentary material production	***1B001***
Fibrous or filamentary material production (R)	***1B101***
Fibrous of filamentary materials, not controlled by 1C010 or 1C210	***1C993***

Inertial navigation system not controlled under 7A003 or 7A103	*7A994*
Inertial sensors, optical fiber	*6A002*
Information security equipment, n.e.s.	*5A995*
Information security equipment, n.e.s., software	*5D995*
Information security equipment, n.e.s., technology	*5E995*
Information security software	*5D002*
Information security systems/equipment/devices	*5A002*
Information security technology	*5E002*
Information security technology support software	*5D002*
Infrared cameras, imaging	*6A003*
Infrared detectors, space qualified/non-space qualified	*6A002*
Infrared detectors arrays, non-space qualified	*6A002*
Infrared sensors	*6A002*
Initiation systems, single or multipoint (electric)	*3A232*
Initiators, explosive detonators (electric)	*3A232*
Inorganic chemicals produced or derived from the Naval Petroleum Reserves	*1C980*
Inorganic fibrous and filamentary materials	*1C010*
Inorganic fibrous and filamentary materials (R)	*1C210*
Inorganic overlay coating application technology	*2E003*
Inspection machines, manual dimensional	*2B992*
Inspection machines, software for 2B992 equipment	*2E991*
Inspection machines, technology for 2B992 equipment	*2E993*
Instrumentation cameras	*6A003*
Instrumentation cameras (R)	*6A203*
Instrumentation for gas turbine development	*9B002*
Instrumentation for wind tunnels	*9B005*
Instrumentation systems, inertial navigation	*7A003*
Integrated Services Digital Network (ISDN) equipment	*5A001*
Integrated Services Network development or production technology	*5E001*
Integrated circuit computer-aided-design (CAD) software	*3D003*
Integrated circuit test equipment, functional test/microwave/(R)	*3B008*
Integrated circuit, masks or reticles for	*3B007*
Integrated circuit, masks	*3B007*
Integrated circuits, general purpose industrial	*3A001*
Integrated circuits, microwave (R)	*3A001*
Integrated flight instrument system/components/instrumentation	*7A103*
Integrated system source code, avionics/mission systems	*7D003*
Integration software development technology, expert systems	*2E003*
Intercepting devices, parts and accessories (communications)	*5A980*
Interconnect equipment (Computer)	*4A003*
Interferometers, velocity (VISARs)	*6A225*
Interlacing machines	*1B001*
Interlacing machines	*1B101*
Intermediate amplifier equipment	*5A001*
Intrinsic magnetic gradiometer	*6A006*
Inverse synthetic radar (ISAR)	*6A008*
Inverters (Frequency changers or converters)(R)	*3A225*
Ion beam equipment for mask making/semiconductor devices	*3B006*
Ion beam sensitive resist materials	*3C002*
Ion implantation equipment	*3B002*
Ion implantation production equipment	*2B005*
Ion plating production equipment	*2B005*
Ion sources, ICP/MS mass spectrometers	*3A233*
Ion sources, electron bombardment mass spectrometers	*3A233*
Ion sources, glow discharge mass spectrometers (GDMS)	*3A233*

Molecular beam epitaxial growth equipment using gas sources	*3B001*
Molecular beam mass spectrometers	*3A233*
Molybdenum and tungsten metals alloys	*1C117*
Monitoring systems, toxic gas	*2B351*
Monkey pax virus	*1C351*
Monolithic integrated circuits, industrial	*3A001*
Motion control boards, for CNC machine tools	*2B001*
Multi-chamber central wafer handling systems	*3B005*
Multi-data-stream processing, development/production technology	*4E993*
Multi-element detector arrays	*6A002*
Multi-element photodiodes and phototransistors	*6A002*
Multi-layer hetero-epitaxial material substrates	*3C001*
Multi-layer masks with phase shift layer, for integrated circuits	*3B007*
Multi-level priority circuit switching capability	*5A001*
Multichip integrated circuits, industrial	*3A001*
Multilevel security capability, equipment	*5A002*
Multiple seal valves incorporating a leak detection port	*2B350*
Multiplex equipment	*5A001*
Multipoint initiation systems	*3A232*
Multispectral imaging sensors	*6A002*
Multistage light gas gun systems	*2B232*
Mycoplasma mycoides	*1C352*
NDT (non-destructive) inspection equipment (3D)	*1B001*
NDT (non-destructive test) inspection equipment (rocket motor)	*9B007*
Natural gas liquids	*1C983*
Natural gas derivatives	*1C983*
Navigation, test/inspection/production equipment for (n.e.s.)	*7B994*
Navigation systems/equipment/components , inertial	*7A103*
Navigation direction finding equipment not controlled by 7A003 or 7A103	*7A994*
Navigation software, n.e.s.	*7D994*
Navigation technology, n.e.s.	*7E994*
Navigation test, inspection, production equipment, n.e.s.	*7B994*
Neodymium-doped/glass lasers	*6A005*
Neptunium-237 or materials containing it	*0C003*
Network access controllers, transmission equipment	*5A991*
Network access controllers, transmission equipment (software)	*5D990*
Network access controllers, transmission equipment (technology)	*5E990*
Network access controllers contained in computer equipment	*4A003*
Network access controllers contained in telecommunications equipment	*5A001*
Network analyzers	*3A002*
Neural computers/assemblies/components	*4A004*
Neural network integrated circuits	*3A001*
Neutron generator systems and tubes	*3A231*
Newcastle disease virus	*1C352*
Nickel alloy/powders	*1C002*
Nickel aluminides	*1C002*
Nickel metal (made from powder metals/alloys/powders)	*0C006*
Nickel metal powders	*0C006*
Niobium (Columbium) alloys/powders	*1C002*
Nitrided niobium-titanium-tungsten alloy made/coated crucibles	*2A225*
2-Nitrodiphenylamine	*1C115*
Nitrogen dioxide (dinitrogen tetroxide	*1C115*
Noise cancellation systems for vessels, active	*8A002*
Noise reduction equipment for vessels, acoustic mounts	*8A002*
Noise reduction systems for vessels, active	*8A002*

Optical integrated circuits	*3A001*
Optical materials, with non-linear characteristics	*6C004*
Optical mirrors (reflectors)	*6A004*
Optical mirrors	*6A005*
Optical opacity switches (filters)	*6A004*
Optical scatter based surface irregularity measuring equipment	*2B006*
Optical sensor cryocoolers/optical fibers	*6A002*
Optical sighting devices	*0A985*
Optical storage equipment, equipment for the development/production of	*4B994*
Optical storage equipment, equip. for development/production of, software	*4D994*
Optical surface coating/treatment technology	*6E003*
Optical switching equipment	*5A001*
Optical-electro shutters, Kerr or Pocket cells	*6A203*
Optics, (optical components	*6A004*
Organo-metallic components	*3C003*
Organic fibrous and filamentary materials	*1C010*
Orthochlorobenzalmalononitrile	*1A984*
Oscilloscope, plug-in modules for entries 3A202.b	*3A202*
Oscilloscope, Analog, Analog sampling and Digital	*3A202*
Oxygen Iodine (O_2-I) laser	*6A005*
PABXs (Private Automatic Branch Exchanges)	*5A001*
PBAA (Polybutadiene-acrylic acid)	*1C115*
PBAN (Polybutadiene-acrylic acid-acrylonitrile	*1C115*
PCM (Pulse Code Modulation) testers	*5B001*
PEEK (Polyether either ketone	*1C008*
PEK (Polyether ketone)	*1C008*
PEKEKK (Polyether Ketone ether ketone ketone	*1C008*
PEKK (Polyether ketone ketone)	*1C008*
PLAs (Programmable Logic Arrays)	*3A001*
Packet switching equipment	*5A001*
Para-hydrogen Raman shifters	*6A205*
Passive acoustic SYSTEMS	*6a001*
Passive sensors, direction finding system	*7A115*
Pasteurella pseudotuberculosis var pestis (Yersinia pestis)	*1C351*
Pathogens, animal	*1C352*
Pathogens gentically modified mircoorganisms	*1C353*
Pathogens, human	*1C351*
Pathogens, plant 1C354	
Penetrators/connectors (fibers optic), hull	*8A002*
Petroleum, crude	*1C981*
Petroleum products	*1C982*
Performance improvement software, navigation systems	*7D003*
Performance improvement source code, navigation systems	*7D003*
Peste des petits ruminants virus	*1C352*
Phased array antennae	*5A001*
Phased array/segment mirror control equipment	*6A004*
Phenylene, as lubricating fluids	*1C006*
	Phosphate glass 6C004
Phosphor bronze mesh	*1A226*
Phosphorus hybrides	*3C004*
Phosphorous oxychloride/pentachoride/pentasulfide/trichloride	*1C350*
Photocathodes of GaAs or GainAs	*6A002*
Photodiodes, single and element semiconductor type	*6A002*

Photographic still cameras, underwater	*8/a002*
Photomultiplier tubes	*6A202*
Phototransistor, single and multi-element	*6A002*
Photovoltaic arrays, space qualified or rediation hardened	*3A001*
Piezoelectric polymer and copolymer, components	*1A001*
Piezoelectric sensing elements, hydrophones	*6A001*
Pinacolone/pinaclyl alcohol	*1C350*
Piping, multiwalled incorporating a leak detection port	*2B350*
Planar absorbers1C001	
	Plant pathogens 1C 354
Plasma atomization and melting furnaces	*2B227*
Plasma dry etching equipment	*3B003*
Plasma enchanced CVD equipment	*3B004*
Plasma spraying production equipment	*2B005*
Platinized catalysts	*1A225*
Plug-in units for oscilloscopes of entries 3A202.b or .c	*3A202*
Pockel or Kerr cells, electro-optical shuttering	*6A203*
Polyetherimides/Polyamide-imides, aromatic	*1C008*
	Polyaniline 1C 001
Polyarylene ether ketones (PEEK, PEKK, PEK,PEKEKK)	*1C008*
Polybenzothiazoles, development/production technology	*1E002*
Polybenzoxazoles, development/production technology	*1E002*
Polybiphenylenethersulphone	*1C008*
Polybromotrifluoroethylene based damping of flotation fluids	*1C006*
Polybutadiene-acrylic acid (PBAA)	*1C115*
Polybutadiene-acrylic acid-acrylonitrile (PBAN)	*1C115*
Polycarbosilaznes, for producing ceramic made from Si/C/N	*1C007*
Polychorotrifluoroethylene based damping or flotation fluids	*1C006*
Polydiorganosilanes, for producing silicon carbide	*1C007*
Polyether ether ketone (PEEK)	*1C008*
Polyether Ketone (PEK)	*1C008*
Polyether ketone ether ketone ketone (PEKEKK)	*1C008*
Polyether ketone ketone (PEKK)	*1C008*
Polygraphs and specially designed parts and accessories, n.e.s.	*3A981*
Polygraphs, software/technology	*3D981*
Polyimides, aromatic	*1C008*
Polyimides, fluorinated	*1C009*
Polymeric (fluorinated) substances, components	*1A001*
Polymeric non-fluorinated substances, manufactures of	*1A003*
Polymeric substances and components	*1A001*
Polymeric substances, fluorinated	*1C009*
Polymeric substances, non-fluorinated	*1C008*
Polymeric substances, propellant	*1C115*
Polymers, piezoelectric	*1A001*
Polyphenylene-vinylene/polypyrrole	*1C001*
Polysilazanes, for production silicon nitride	*1C007*
	Polythiophene 1C 001
Porcine enterovirus type 9	*1C352*
Porcine herpes virus (Aujeszky's disease)	*1C352*

Porous nickel metal	*0C006*
Portable electric generators	*2A994*
Portable electric generators, software	*2D994*
Portable electric generators, technology	*2E994*
Positioning equipment/components global (R)	*7A994*
Positioning systems, acoustic	*6A001*
Positive resists for semiconductor llithography	*3C002*
Post-flight data processing software	*6D103*
Potassium cyanide/fluoride/hydrogen fluoride	*1C350*
Potassium titanyl arsenate (KTA)	*6C004*
Powder metallurgy manufacturing equipment	*9B009*
Powdered metals, as fuel	*1C115*
Power supplies, direct current high power (dc)	*3A226*
Power supplies, direct current high-voltage	*3A227*
Power supplies, vacuum induction furnace	*2B226*
Power transmission systems, marine	*8A002*
Power transmission shaft systems, marine	*8A002*
Precision tracking systems, usable for missiles	*6A108*
Precursors for toxic chemical agents	*1C350*
Perform production equipment	*1B101*
Performs, fibrous or filamentary materials	*1C010*
Performs, fibrous or filamentary materials (R)	*9A110*
Performs, glass for optical fibers	*5C001*
Performs, glass for high birefringence optical fibers	*6C002*
Performs, glass for fluoride fibers	*6C004*
Performs, metal coated fiber (for propulsion systems)	*9A110*
Prepreg production equipment (hot melt method)	*1B001*
Prepreg production equipment	*1B101*
Prepregs, fibrous or filamentary materials	*1C010*
Prepregs, fibrous or filamentary materials	*9A110*
Presses, hot isostatic	*2B004*
Presses, hot isostatic	*2B104*
Presses, hot isostatic	*2B204*
Pressure measuring instruments, with corrosion resistant sensor	*2B230*
Pressure senors, manganin and quartz	*6A226*
Primary cells/batteries, high energy	*3A001*
Printed circuit boards, machine tool CNC unit	*2B009*
Private automatic branch exchanges (PABXs)	*5A001*
Probing (test) systems, semiconductor devices	*3B008*
Production equipment, propulsion systems and components/reentry vehicles	*9B115*
Production facilities, reentry vehicles/rockets/propulsion systems/ co mponents	*9B 116*
Program proof and validation software	*4D993*
Program proof and validation software, development/production/use tec hnology	*4E 992*
Programmable gate arrays (FPGA's)/logic arrays (FPLA's), field	*3A001*
Projectile accelerators	*2B232*

3-Quinuclidone 1C 350

Radar altimeters 7A106

Radar cross section measurement systems missile	*6B108*
Radar equipment and components n.e.s., airborne	*6A990*
Radar equipment and components n.e.s., airborne (software)	*6D990*
Radar equipment and components n.e.s., airborne (technology)	*6E990*
Radar systems and components, industrial	*6A008*
Radar systems, capable of use with missiles	*6A108*
Radiation hardened TV cameras	*6A203*
Radiation hardened designed (or Rated) robots	*2B007*
Radiation hardened detectors	*6A002*
Radiation hardened detectors	*6A102*
Radiation hardened electronic computers/equipment/components	*4A001*
Radiation hardened integrated circuits, industrial	*3A001*
Radiation hardened robots	*2B007*
Radiation hardened sensors	*6A002*
Radiation sensors, optical fibers	*6A002*
Radiation shielding windows	*1A227*

Radio equipment5A001

Radio relay communications equipment	*5A993*
Radio relay communications, software	*5D993*
Radio relay communications, technology	*5E993*
Radio transmission media simulators/channel estimators	*5B001*
Radiographic equipment	*3A101*
Radionuclides, alpha-emitting	*1C236*

Radium-226 1C 237

Radome design software	*6D003*
Ram type electrical discharge machine (CNC)	*2B001*
Raman shift lasers	*6A205*
Range gated illumination systems, underwater	*8A002*
Range instrumentation radars	*6A108*
Rankine cycle engine, air independent	*8A002*
Reactor vessels, chemical	*2B350*
Reactors, metal organic chemical vapor deposition (MOCVD)	*3B001*
Real time full authority test facility software, aeroengines	*9D004*
Receivers, microwave test	*3A002*

Receivers, radio 5A 001

Rechargeable cells/batteries, high energy	*3A001*
Reciprocating diesel engine component development/production technology	*9E003*
Reciprocating diesel engine development/production technology	*9E003*
Recorders, transient	*3A202*
Recording equipment	*3A002*
Reduced observables analysis software	*1D103*
Reduction gearing, light-weight marine transmissions	*8A002*
Reentry vehicles and production equipment	*9A116*
Reentry vehicle/components, production equipment	*9B115*
Reflectance measuring equipment, absolute	*6B004*
Reflectivity (electromagnetic) reducting materials	*1C101*
Reflectometers, mirror characterization	*7B102*

Reflectors (mirrors), optical	*6A004*
Refrigeration units, hydrogen or helium	*1B231*
Regulation of composites temperature/pressure\/atmosphere technology	*1E103*
Remote manipulators	*2B225*
Remotely controlled manipulators, for submersibles	*8A002*
Remotely operated filling equipment, chemical	*2B350*
Repeater/regenerator equipment	*5A001*
Resaturated pyrolized materials	*1A102*
Resin impregnated fiber prepregs	*9A110*
Resist materials, coated (semiconductor) substrates	*3C002*
Resist materials, semiconductor lithography	*3C002*
Restraint devices, electronic monitoring	*3A981*
Restraint devices, electronic monitoring (software)	*3D980*
Restraint devices, electronic monitoring (technology)	*3E980*
Reticles, integrated circuits of 3A001	*3B007*
Ricin/Rickettsia prowasecki/Rickettsia quintana/Rickettsia rickettsii/Rickettsiae/ Rift Valley fever virus	*3C351*
	Rinderpest virus *1C 352*
Ring gyros (laser) and gyro components	*7A002*
Ring laser gyro mirror characterizing equipment	*7B002*
Robot and end-effectors, use software	*2D201*
Robot controllers for high explosive handling/industrial	*2B207*
Robot end-effectors for high explosive handling (R)	*2B207*
Robots, not controlled by 2B007 or 2B207	*2B994*
Robots, software for 2B994 equipment	*2D993*
Robots, technology for 2B994 equipment	*2E993*
Robots with realtime 3D image processing or scene analysis (R)	*2B007*
Robots designed for an explosive/munitions environment (R)	*2B007*
Robots designed (or rated) as radiation hardened (R)	*2B007*
Robots designed for high explosive handling (R)	*2B207*
Robots designed for underwater use (R)	*8A002*
	Rocket fuels *1C 115*
Rocket handling and control equipment	*9A115*
Rocket launching equipment/activation apparatus/devices	*9A115*
Rocket motor inspection equipment	*9B007*
Rocket/rocket motor, test benches/stands	*9B117*
Rockets, space launch	*9A004*
Roller bearings, solid	*2A001*
Roller bearings, solid	*2A002*
Roller bearings, solid taper	*2A003*
Rotary position feedback units	*2B008*
Rotary tables, compound	*2B009*
Rotor assembly mandrels, bellows forming	*2B228*
Rotor blade components, tooling for manufacture	*9B009*
Rotor blade tip clearance control active compensating system software	*9D004*
Rotor centrifugal balancing machines	*2B229*
Rotor fabrication/assembly equipment	*2B228*
Rotor forming mandrels, precision cylindrical	*2B215*
Rotor straightening equipment or system	*2B228*
Routers, telecommunications	*5A001*

Skin friction transducer, wall	*9B008*
Skirts, for surface effect vessels	*8A002*
Slapper detonators (Electric)	*3A232*
Slide way assemblies for machine tools	*2B008*
Slurry propellant control systems	*9A106*
Small waterplane area vessels	*8A001*
Sodium (Na) metal vapor lasers	*6A005*
Sodium bifluoride/cuanide/fluoride/sulphide	*1C350*
Software, see sub-category D for controls for each category	
Software, adaptive control	*2D002*
Software, analysis of reduced observables	*1D103*
Software, compilers for multi-data-stream processing equipment	*4D003*
Software, composite manufacturing equipment use of 1B101 goods	*1D201*
Software, composite materials (organic/metals/carbons matrix)	*1D002*
Software, digital computers	*4D*
Software, filament winding machine use	*1D201*
Software, multi-data-stream processing equipment operating systems	*4D003*
Software, numerical control	*2D002*
Software, opening systems for real time processing equipment	*4D003*
Software, source code/software development tools as source code/tools in source code	*4D003*
Solar cells, space qualified or radiation hardened	*3A001*
Solenoids, superconductive	*3A001*
Solenoids, superconductive (R)	*3A201*
Solid rocket fuels, industrial	*1C115*
Solid roller bearings	*2A001*
Solid roller bearings	*2A002*
Solid state cameras	*6A003*
Solid state imaging devices	*6A203*
Solid state joining equipment, tools/dies/fixtures	*9B004*
Solid state lasers, tunable/non-tunable	*6A005*
Solid state microwave amplifiers	*3A001*
Solid state switches	*3A228*
Solid-state imaging devices	*6A002*
Sonar log equipment/processing equipment/signal processing equipment	*6A001*
Source code, automatic generation software	*4D994*
Source code, automatic generation software (technology)	*4E992*
Source code, development of goods as specified	*7D003*
Source code, multi-data stream processing equipment software	*4D003*
Space launch vehicles/probes	*9A004*
Space-qualified optical components	*6A004*
Space-qualified solid-state-detectors, single element/focal plane arrays	*6A002*
Spacecraft	*9A004*
Spacecraft inertial navigation equipment/components	*7A003*
Spark-gap, triggered	*3A228*
Spectrum analyzers	*3A002*
Spherical aluminum powder	*1C115*
Spin forming/Flow forming equipment, use software	*2D201*
Spin-forming machines, with over two axes simultaneous control	*2B115*
Spin-forming machines combining a flow-forming function	*2B115*
Spindle assemblies, machine tools	*2B008*
Spraying production equipment, plasma with controlled atmosphere	*2B005*
Spread spectrum radio equipment	*5A001*
Spread spectrum spreading code generation	*5A002*

Superconductive gates, current switching	*3A001*
Superconductive propulsion engines	*8A002*
Superconductive quantum interference devices (SQUIDS)	*6A006*
Superplastic forming technology, metal working	*2E003*
Superplastic forming technology/data, Al/Ti/Super alloys	*2E003*
Superplastic forming tools, dies, molds or fixtures	*1B003*
Surface acoustic wave devices	*3A001*
Surface coating and processing equipment, non-electronic substrates	*2B005*
Surface irregularity measuring equipment/instruments	*2B006*
Surface skimming (shallow bulk) acoustic wave devices	*3A001*
Surface vessel positioning systems, acoustic	*6A001*
Surface vessels, industrial (R)	*8A001*
Surface-effect vehicles and components, (rigid sidewalls)	*8A001*
Surface-effect vehicles, fully skirted variety) (R)	*8A001*
Surface-effect vehicles, fingers/seals/skirts) (R)	*8A002*
Survey systems, bathymetric	*6A001*
Swept frequency network analyzers	*3A002*
Swine fever virus (Hog cholera virus)	*1C352*
Swine vesicular disease virus (Porcine enterovirus type 9)	*1C352*
Switch fabric development/production technology	*5E001*
Switches, optical opacity (filters)	*6A004*
Switches, solid state	*3A228*
Switching devices/modules or assemblies	*3A228*
Switching equipment/system software (Telecommunications)	*5D001*
Synchronous Digital Heirarchy (SDH) technology	*5E001*
Synchronous, Optical Network technology (SONET)	*5E001*
Syntactic foam, underwater use	*8C001*
Synthetic aperture radar (SAR)	*6A008*
Synthetic diamond material	*6C004*
Systolic array computers/assemblies/components	*4A004*
TEGDN (Triethylene glycol dinitrate) propellant additive	*1C115*
TIMS (Thermal ionization mass spectrometers)	*3A233*
TV cameras, radiation-hardened	*6A203*
TWT's (Traveling wave tubes)	*3A001*
Tanks, chemical storage (capacity greater than 100 L)	*2B350*
Tantalum crucibles coated with tantalum carbide/nitride/boride	*2A225*
Tantalum made or lined crucibles	*2A225*
Tape designed for testing recording equipment of entry 3A002	*3A002*
Tape laying machines	*1B001*
Tape laying machines (R)	*1B101*
Tapered roller bearings (solid)	*2A003*
	Tar sands *1C 981*
Tear gas formulation	*1A984*
Technology ---- see sub-category E for controls for each category	
Technology, diamond substrate film development/production	*3E002*
Technology, gas turbine engines/components	*9E003*
Technology, helicopter power transfer systems	*9E003*
Technology, hetero-structure semiconductor device development	*3E002*
Technology, high output type diesel engines/systems/components	*9E003*
Technology, magnetic hard disk drive development/production	*4E002*
Technology, materials processing equipment	*2E001*
Technology, multi-data-stream processing goods	*4E002*
Technology, superconductive electronic device	*3E002*

Technology, tilt rotor/wing power transfer systems development	*9E003*
Technology, vacuum microelectronic device	*3E002*
Telecommunications equipment	*5A001*
Telecommunications equipment, not controlled by 5A001	*5A990*
Telecommunications equipment, not controlled by 5A001, software	*5D990*
Telecommunications equipment, not controlled by 5A001, technology	*5E990*
Telecommunications equipment/system software	*5D001*
Telecommunications production equipment	*5B001*
Telecommunications test equipment	*5B001*
Telecommunications test equipment, n.e.s.	*5B994*
Telecommunications test equipment, n.e.s., software	*5D991*
Telecommunications test equipment, n.e.s., technology	*5E991*
Telemetering and telecontrol equipment	*5A101*
Telemetry equipment/systems	*5A101*
Television cameras, underwater	*8A002*
Tellurium (Te) with purity of 99.9995% or better	*6C002*
Tempest type equipment	*5A002*
Tension stretchers for prepegs/preform production	*1B101*
Terminal interface equipment, digital computers	*4A003*
Terrestrial acoustic equipment n.e.s.	*6A994*
Terrestrial acoustic equipment n.e.s., software	*6D994*
Terrestrial acoustic equipment n.e.s., technology	*6E994*
Terrestrial geophones	*6A001*
Teschen disease virus	*1C352*
Test benches/stands. Rockets/rocket motors	*9B117*
Test chambers, aerosol challenge	*2B352*
Test equipment, semiconductor devices	*3B008*
Test equipment, telecommunications	*5B001*
Test equipment, telecommunications n.e.s.	*5B994*
Test receivers, microwave	*3A002*
Test tape designed for recording equipment of entry 3A002	*3A002*
Tetrodotoxin	*1C351*
Thallium arsenic selenide (Tl_3AsSe_3 or TAS)	*6C004*
Thermal imaging equipment	*6A002*
Thermal ionization mass spectrometers (TIMS)	*3A233*
Thermal sensors, optical fiber	*6A002*
Thermoplastic liquid crystal copolymers	*1C008*
Thio-ethers lubricants lubricating fluids	*1C006*
Thiodiglycol	*1C350*
Thionyl chloride 1C350	
Thrust vector control sub-systems, liquid rocket propulsion (R)	*9A106*
Thuja plicata (Western red cedar)	*1C988*
Thulium-YAG (Tm:YAG)/thulium-YSGG (Tm:YSGG) lasers	*6A005*
Thumbcuffs	*0A982*
Thumbscrews	*0A983*
Tilt-rotor/tilt wing power transfer system technology	*9E003*

Tunable lasers, solid state	*6A005*
Tunable optical filters	*6A004*
Tungsten and molybdenum metals alloys	*1C117*
Tungsten alloys	*1C004*
Tungsten and tungsten alloys/carbides, as parts	*1C226*
Turbofan and turbojet engines, lightweight and turbocompound engines	*9A101*
Turning machines	*2B001*
Turning machines for optical quality surfaces	*2B002*
Two dimensional focal plane arrays	*6A002*
UF_6 production plant, equipment and components	*0B003*
Underwater (propeller) noise reduction software	*8D002*
Underwater breathing apparatus (scuba gear), self-contained	*8A993*
Underwater breathing apparatus (scuba gear), self-contained, software	*8D993*
Underwater breathing apparatus (scuba gear), self-contained, technology	*8E993*
Underwater camera equipment, n.e.s.	*8A992*
Underwater camera equipment, n.e.s., software	*8D992*
Underwater camera equipment, n.e.s., technology	*8E992*
Underwater cameras, photographic/electronic imaging systems	*8A002*
Underwater communications systems/cable	*5A001*
Underwater noise reduction technology	*8E002*
Underwater optical fiber cables and accessories	*5A001*
Underwater robots, computer controlled	*8A002*
Underwater vehicles, industrial	*8A001*
Underwater velocity measurement equipment	*6A001*
Underwater vision systems	*8A002*
Unmanned tethered/untethered submersible vehicles	*8A001*
Uranium fluoride (UF_6) production plants, equipment and components	*0B003*
Uranium titanium alloys	*1C004*
Vaccines	*1C991*
Vacuum induction furnace, power supplies	*2B226*
Vacuum melting, remelt and casting furnaces	*2B227*
Vacuum microelectric device development/production technology	*3E002*
Vacuum pumps	*2B231*
Vacuum sprytron tubes	*3A228*
Valve seals	*1A001*
Valves, bellows/bellows seal/diaphragm/double-seal/multiple seal incorporating a leak detection port/non-return (check)	*2B350*
Valves, gaseous diffusion isotope separation	*0B001*
Variola virus	*1C351*
Vector processors/assemblies	*4A003*
Vehicles, space/space craft/rocket launch support	*9A115*
Velocity interferometers (VISARs)	*6A225*
Velocity measurement equipment, underwater	*6A001*
Venezuelan equine encephalitis virus	*1C351*
Ventilated propellers	*8A002*
Verotoxin	*1C351*
Vesicular stomatitis virus	*1C352*
Vessel positioning systems, acoustic	*6A001*
Vessels, marine	*8A001*
Vibration test equipment/parts/components, n.e.s.	*9B994*
Vibration test equipment/parts/components, n.e.s., software	*9D994*
Vibration test equipment/parts/components, n.e.s., technology	*9E994*
Vibration test equipment production/use software	*2D101*
Vibration test equipment use software	*9D003*

Vibration test equipment using digital control techniques	***2B116***
Vibration test equipment, acoustic	***9B006***
Vibrio cholerae	***1C351***
Video cameras incorporating solid state sensors	***6A003***
Vinylidene flouride copolymers	***1C009***
Vinylidene flouride copolymers, components of	***1A001***
Virus protection software for information security software	***5D002***
Viruses, animal pathogens	***1C352***
Viruses human pathogens	***1C351***
Viscous software, 2D or 3D engine flow modelling	***9D004***
Vision systems, underwater	***8A002***
Voice print identification and analysis equipment and parts, n.e.s.	***3A980***
Voice print identification and analysis, software	***3D980***
Voice print identification and analysis, technology	***3E980***
Wafer handling systems, semiconductor	***3B005***
Wafers, comprising multiple epitaxially grown layers	***3C001***
Wafers, semiconductor with function determined	***3A001***
Wall skin friction transducers	***9B008***
Water (or liquid) jet cutting machines (CNC)	***2B001***
Water jet (pumpjet) propulsion systems	***8A002***
Water tunnels, propulsion model acoustic field measurement	***8B001***
Water-hydrogen sulfide exchange tray columns	***1B229***
Water-screw propellers	***8A002***
Wave division multiplex equipment	***5A001***
Waveform digitizers (Transient recorders)	***3A002***
Wax pattern preparation equipment, ceramic shell	***9B001***
Weaving machines	***1B001***
Western equine encephalitis virus	***1C351***
Western red cedar	***1C998***
Wet-spinning equipment for refractory ceramics	***1B001***
Wet-spinning equipment for refractory ceramics	***1B101***
White pox	***1C351***
Wide-swath bathymetric survey systems	***6A001***
Wind tunnel aero-model technology	***9E003***
Wind tunnel, control systems	***9B005***
Wind tunnels, usable for missiles	***9B105***
Windows, glass for nuclear radiation shielding	***1A227***
Wire feed type EDMs (CNC)	***2B001***
Work stations, as computers having a CTP above 260 Mtops	***4A003***
X-ray (non planar) inspection equipment, rocket motors	***9B007***
X-ray equipment, radiographic	***3A101***
X-ray generators, flash discharge (R)	***3A201***
X-ray generators, flash discharge systems	***3A001***
X-ray sensitive resist materials	***3C002***
Xanthomonas albilineans/campestris pv.citri/citri	***1C354***
Yellow fever virus	***1C351***
Yttrium oxide (yttria) (Y_2O_3) made/coated crucibles	***2A225***
Zinc selenide (ZnSe), substrate blanks	***6C004***
Zinc sulfide (ZnS), substrate blanks	***6C004***
Zirconium fluoride (ZrF_4) glass	***6C004***
Zirconium metal/alloy powder (fuel)	***1C115***
Zirconium metal/alloy/compounds	***1C234***
Zirconium oxide (zirconia) (ZrO_2) made/coated crucibles	***2A225***
Zoonoses	***1C351***

THE COMMERCE CONTROL LIST

CATEGORY 0 NUCLEAR MATERIALS, FACILITIES & EQUIPMENT AND MISCELLANEOUS

0A018 ***Items on the International Munitions List.***

0A980 ***Horses by sea.***

0A982 ***Saps; thumbcuffs, leg irons, shackles, and handcuffs; straight jackets, plastic handcuffs, police helmets and shields; and parts and accessories, n.e.s.***

0A983 ***Specially designed implements of torture and thumbscrews; and parts and accessories, n.e.s.***

0A984 ***Shotguns, barrel length 18 inches (45.72cm) or over; buckshot shotgun shells; except equipment used exclusively to treat or tranquilize animals, and except arms designed solely for signal, flare, or saluting use; and parts, n.e.s.***

0A985 ***Optical sighting devices for shotguns controlled by 0A985; discharge type arms (for example, stun guns, shock batons, electric cattle prods, immobilization guns and projectiles, etc.) Except equipment used exclusively to treat or tranquilize animals, and except arms designed for signal, flare, or saluting use; and parts, n.e.s.***

0A986 ***Shotgun shells, except buckshot shotgun shells, and parts.***

0A988 ***Conventional military steel helmets as described by 0A018.f.1; and machetes.***

0B001 ***Valves, specially designed or prepared for gaseous diffusion separation process, that are wholly made of or lined with aluminum, aluminum alloys, nickel, or alloy containing 60 percent by weight or more nickel, 40mm (1.6in) or more in diameter, with bellows seals, and specially designed parts and components therefor.***

0B003 ***Plants for the production of uranium hexaflouride (UF_6) and specially designed or prepared equipment (including UF_6) purification equipment), and specially designed parts and accessories therefor.***

0B008 ***Reactor and power plant simulators and analytical models for reactor and power plant simulators, models or mock-ups.***

0C006 ***Nickel powder and porous nickel metal.***

0D001 ***"Software" specially designed or modified for the "development", "production", or "use" of items controlled by 0B001, 0B003, 0B008 or 0C006.***

0E001 ***"Technology" according to the General Technology Note for the "development", "production" or "use" of items controlled by 0B001, 0B003, 0B008 or 0C006.***

0E018 ***"Technology" for the "development", "production", or "use" of items controlled by 0A018.b through 0A018.e.***

0E984 ***"Technology" for the "development" or "production" of shotguns controlled by 0A984 and buckshot shotgun shells.***

CATEGORY 1 MATERIALS, CHEMICALS, "MICROORGANISM", AND TOXINS

1A001 ***Components made from fluorinated compounds.***

1A002 ***"Composite" structures or laminates.***

1A003 ***Manufactures of non-fluorinated polymeric substances controlled by 1C008.a, in film, sheet, tape or ribbon form.***

1A102 ***Resaturated pyrolixzed carbon-carbon materials designed for system controlled by 9A004.***

1A202 ***"Composite" structures, other than those controlled by 1A002, in the form of tubes with an inside diameter of between 74mm and 400mm made with "fibrous or filamentary materials" controlled by 1C010.a of .b or 1C210.***

1A225 ***Platinized catalysts specially designed or prepared for promoting the hydrogen isotope exchange reaction between hydrogen and water for the recovery of tritium from heavy water or the production of heavy water.***

1A226 ***Specialized packings for use in separation heavy water from ordinary water and made of phosphor bronze mesh (chemically treated to improve wetability) and designed for use in vacuum distillation towers.***

1A227 ***High density (lead glass or other) radiation shielding windows greater than 0.09 m^3 on cold area and with a density greater than 3 g/cm^3 and a thickness of 100mm or greater; and specially designed frames therefor.***

1A290 ***Depleted uranium (any uranium containing less than 0.717% of the isotope U-235) in shipments of more than 1,000 kilograms in the form of shielding contained in X-ray units, radiographic exposure or teletherapy devices, radioactive thermoelectric generators or packaging for the transportation of radioactive materials.***

1A984 ***Chemical agents, including tear gas formulation containing 1 percent of less of orthochlorobenzalmalononitrile (CS), or 1 percent or less of chloroacetophenone (CN), except in individual containers with a net weight of 20 grams of less; smoke bombs; non-irritant smoke flares, canisters, grenades and charges; other pyrotechnics articles having dual military and commercial use; and fingerprinting powders, dyes and inks.***

1A988 ***Bulletproof and bullet resistant vests.***

1B001 ***Equipment for the "production" if fibers, prepregs, performs or "composites" controlled by 1A002 or 1C010, and specially designed components and accessories therefor***

1B002 ***Systems and components therefor specially designed for producing metal alloys, metal alloy powder or alloyed materials controlled by 1C002.a.2, 1C002.b, or 1C002.c.***

1B003 ***Tools, dies, molds or fixtures, for "superplastic forming" or "diffusion bonding" titanium of aluminum or their alloys, specially designed for the manufacture of equipment described in this entry.***

1B018 ***Equipment on the International Munitions List***

1B101 ***Equipment, other than that controlled by 1B001, for the production of structural composites and specially designed components and accessories thereof.***

1B115 ***Equipment for the "production", handling and acceptance testing of propellants or propellant constituents specified in 1C115.***

1B116 ***Specially designed nozzles for producing pyrolitically derived materials formed on a mold, mandrel or other substrate from precursor gases that decompose in the 1573K (1300 C) to 317K (2900 C) temperature range at pressures of 130Pa to 20kPa.***

1B201 ***Filament winding machines, other than those specified in 1B001 or 1B101, in which the motions for positioning, wrapping, and winding fibers are coordinated and programmed in two or more axes, specially designed to fabricate "composite" structures or laminates from "fibrous and filamentary materials" and capable of winding cylindrical rotors of diameters between 75mm (3in.) and 400mm (16in.) and lengths of 600mm (24in.) or greater; coordinating and programming controls therefor; and precision mandrels therefor.***

1B226 ***Electromagnetic isotope separators designed for, or equipped with, single or multiple ion sources capable of providing a total ion beam current of 50mA or greater.***

1B227 ***Ammonia synthesis converters of ammonia synthesis units in which the synthesis gas (nitrogen and hydrogen) is withdrawn from an ammonia/hydrogen high-pressure exchange column and the synthesized ammonia is returned to that column.***

1B228 ***Hydrogen-cryogenic distillation columns having all of the following characteristics.***

1B229 ***Water-hydrogen sulfide exchange tray columns constructed from fine carbon steel with a diameter of 1.8m (6ft) or grater that can operate at a nominal pressure of 2MPa (300psi) or greater, and internal contractors therefor.***

1B230 ***Pumps circulating solution of diluted or concentrated potassium amide catalyst in liquid ammonia (KNH_2/NH_3) having all of the following characteristics.***

1B231 ***Tritium facilities, plants and equipment.***

1B232 ***Turbo expanders or turbo expander-compressor sets designed for operation below 35K and a throughput of hydrogen gas of 1000kg/hr of greater.***

1C001 ***Materials specially designed for use as absorbers of electromagnetic wave, or intrinsically conductive polymers.***

1C002 ***Metal alloys, metal alloy powder or alloyed materials.***

1C003 ***Magnetic metals, of all types and of whatever form, having any of the following characteristics.***

1C004 ***Uranium titanium alloys or tungsten alloys with a "matrix" based on iron, nickel or copper.***

1C005 ***"Superconductive" "composite" conductors in lengths exceeding 100m or with a mass exceeding 100g.***

1C006 ***Fluids and lubricating materials.***

1C007 ***Ceramic base materials, non-"composite" ceramic, materials, ceramic "matrix" "composite" materials and precursor materials.***

1C008 ***Non-fluorinated polymeric substances.***

1C009 ***Unprocessed fluorinated compounds.***

1C010 ***"Fibrous and filamentary materials" that may be used in organic "matrix", metallic "matrix" or carbon "matrix" "composite" structures or laminates.***

1C018 ***Materials on the International Munitions List.***

1C101 ***Materials and devices for reduced observable such as radar reflectivity, ultraviolet/infrared signatures and acoustic signatures other than those controlled by 1C001, usable in "missiles" and their subsystems.***

1C107 ***Graphic and ceramic materials***

1C115 ***Propellants and constituent chemicals for propellants.***

1C116 ***Maraging steels (steels generally characterized by high nickel, very low carbon content and the use of substitutional elements or precipitates to produce age-hardening), other than those controlled by 1C126, having an Ultimate Tensile Strength of 1500MPa or greater measured at 293K (20 C), in the form of sheet, plate, or tubing with a wall or plate, or tubing with a wall or plate thickness equal to or less than 5.0mm (0.2 inch).***

1C202 ***Aluminum and titanium alloys in the form of tubes or cylindrical solid forms (including forgings) with an outside diameter of more than 75mm (3 inches).***

1C210 ***"Fibrous and filamentary materials" not controlled by 1C010.***

1C216 ***Maraging steel capable of an ultimate tensile strength of 2050MPs ($2.050x10^9 N/m^2$) ($300,00 lbs./in^2$) or more at 293K (20 C), except forms in which no linear dimension exceeds 75mm (3 inches).***

1C225 ***Boron and boron compounds, mixtures, and loaded materials in which the boron-10 isotope is more than 20% by weight of the total boron content.***

1C226 ***Parts made of tungsten, tungsten carbide, or tungsten alloys (greater than 90% tungsten) having a mass greater than 20kg and q hollow cylindrical symmetry (including cylinder segments) with an inside diameter greater than 100mm (4 in.), but less than 300mm (12 in.), except parts specifically designed for use as weights or gamma-ray collimators.***

1C227 ***Calcium (high purity) containing both less than 1,000 parts per million by weight of metallic impurities other than magnesium and less than 10 parts per million of boron.***

1C228 ***Magnesium (high purity) containing both less than 200 parts per million by weight of metallic impurities other than calcium and less than 10 parts per million of boron.***

1C229 ***High purity (99.9% or greater) bismuth with very low silver content (less than 10 parts per million).***

1C230 ***Beryllium.***

1C231 ***Hafnium.***

1C232 ***Helium-3 or helium isotopically enriched in the helium-3 isotope, mixtures containing helium-3, and products or devices containing any of the foregoing, except; a product or device containing less than 1g of helium-3.***

1C233 ***Lithium.***

1C234 ***Zirconium, with a hafnium content of less than 1 part hafnium to 500 parts zirconium by weight.***

1C236 ***Alpha-emitting radio nuclides having an alpha half-life of 10 days or greater, but less than 200 years, including compounds and mixtures containing these radio nuclides with a total alpha activity of 1 curie per kilogram (37GBq) or greater; except devices containing less than 3.7 GBq (100 millicuries) of alpha activity per device.***

1C237 ***Radium-226, radium-226 compounds, or mixtures containing radium-226, and products or devices containing any of the foregoing; except medical applicators, or a product or device containing not more than 0.37GBq (10 millicuries) of radium-226 in any form.***

1C238 ***Chlorine trifluoride ($C1F_3$).***

1C350 ***Chemicals, that may be used as precursors for toxic chemical agents.***

1C351 ***Human pathogens, zoonoses, and "toxins".***

1C352 ***Animal pathogens.***

1C353 ***Genetically modified "microorganism".***

1C354 ***Plant pathogens.***

1C980 ***Inorganic chemicals listed in Supplement No.1 to part 754 of the EAR that were produced or derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.***

1C981 ***Crude petroleum including reconstituted crude petroleum, tar sands & crude shale oil listed in Supplement No. 1 to part 754 of the EAR***

1C982 ***Other petroleum products listed in Supplement No. 1 to part 754 of the EAR that were produced of derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.***

1C983 ***Natural gas liquids and other natural gas derivatives listed in Supplement No. 1 to Part 754 of the EAR that were produced or derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.***

1C984 ***Manufactured gas and synthetic natural gas (except when commingled with natural gas and thus subject top export authorization from the Department of Energy) listed in Supplement No. 1 to Part 754 of the EAR that were produced or derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.***

1C988 ***Western red cedar (thuja plicata), logs and timber, and rough, dressed and worked lumber containing wane listed in Supplement No. 2 to Part 754 of the EAR.***

1C991 ***Vaccines containing items controlled by ECCNs 1C351, 1C352, 1C353 and 1C354, and immunotoxins.***

1C992 ***Oil well perforators.***

1C993 ***Fibrous and filamentary materials, not controlled by 1C010 or 1C210, for use in "composite" structures and with a specific modulus of $3.18x10^6$m or greater and a specific tensile strength of $7.62x10^4$m or greater.***

1C994 ***Fluorocarbon electronic cooling fluids.***

1C995 ***Mixtures containing precursor and intermediate chemicals used in the "production" of chemical warfare agents that are not controlled by ECCN 1C350.***

1D001 ***"Software" specially designed or modified for the "development", "production", or "use" of items controlled by 1B001 to 1B003.***

1D002 ***"Software" for the "development" of organic matrix, metal matrix or carbon matrix laminates or "composites".***

1D018 ***"Software" specially designed or modified for the "development", "production", or "use of items controlled by 1B018.***

1D101 ***Other "software" not controlled by 1D001, 1D002, 1D103, and 1D018 specially designed for the "development", "production", or "use" of items controlled by 1A, 1B, and 1C for MT reasons.***

1D103 ***"Software" specially designed for analysis of reduced observables such as radar reflectivity, ultraviolet/infrared signatures and acoustic signatures.***

1D201 ***"Software" specially designed or modified for the "use" of items controlled by 1B101 or 1B201 for NP reasons.***

1D390 ***"Software" for process control that is specifically configured to control or initiate :production" of chemicals controlled by ECCN 1C350.***

1D993 ***"Software" specially designed for the "development", "production", or "use" of equipment or materials controlled by 1C210.b, 1C993, 1C994.***

1E001 ***"Technology" according to the General Technology Note for the "development" or "production" of items controlled by 1A001.b, 1A001.c, 1A002, 1A003, 1A102, 1B or 1C (except 1C980 to 1C984, 1C988 and 1C991 to 1C995).***

1E002 ***Other "technology".***

1E101 ***"Technology" according to the GeneralTechnology Note for the "use" of items controlled by 1A102, 1B001, 1B101, 1B115, 1B116, 1C001, 1C101, 1C107 or 1C115 to 1C117 for MT reasons.***

1E103 ***"Technology" (including processing conditions) and procedures for the regulation of temperature, pressures or atmosphere in autoclaves or hydroclaves when used for the "production" of "composites" or partially processed "composites".***

1E104 *"Technology" for producing pyrolytically derived materials formed on a mold, mandrel, or other substrate from precursor gases that decompose at 1,300 C to 2,900 C temperature range at pressures of 130Pa (1mm Hg) 20 kPa (150mm Hg).*

1E201 *"Technology" according to the General Technology Note for the "use" of items controlled by 1A002, 1A202, 1A225 to 1A227, 1A290, 1B001.a, 1B101, 1B201, 1B225 to 1B232, 1C002.a.2.c or a.2.d, 1C010.b, 1C202, 1C210, 1C216, 1C225 to 1C239 or 1D201 for NP reasons.*

1E202 *"Technology" according to the General Technology Note for the "development" or "production" of items controlled by 1A202 or 1A225 to 1A227, or 1A290.*

1E203 *"Technology" according to the General Technology Note for the "development" of "software" controlled by 1D201.*

1E350 *"Technology" for the "use" of chemicals controlled by 1C350 and for facilities designed or intended to produce chemicals controlled by 1C350.*

1E351 *"Technology" for the "use" of microbiological materials controlled by 1C351, 1C352, 1C353, or 1C354.*

1E391 *"Technology" for the disposal of chemicals or microbiological materials controlled by 1C350, 1C352, 1C353, or 1C354.*

1E994 *"Technology" for the "development", "production", or "use" of fibrous and filamentary materials controlled by 1C993 or fluorocarbon electronic cooling fluids controlled by 1C994.*

CATEGORY 2 MATERIALS PROCESSING

2A001 *Ball bearings or solid roller bearings (except tapered roller bearings) having tolerances specified by the manufacturer in accordance with ABEC7, ABEC7P, or ABEC7T or ISO Standard Class 4 or better (or equivalents) and having any of the following characteristics.*

2A002 *Other ball bearings or solid roller bearings (except tapered roller bearings) having tolerances specified by the manufacturer in accordance with ABEC9, ABEC9P of ISO Standard Class 2 or better (or equivalents).*

2A003 *Solid tapered roller bearings, having tolerances specified by the manufacturer in accordance with ANSI/AFBMA Class 00 (inch) or Class A (metric) or better (or equivalents) and having either of the following characteristics.*

2A004 *Gas-lubricated foil bearing manufactured for use at operating temperatures of 561K (288 C) or higher and a unit load capacity exceeding 1 Mpa.*

2A005 *Active magnetic bearing systems.*

2A006 *Fabric-lined self-aligning or fabric-lined journal sliding bearings manufactured for use at operating temperatures below 219K (-54 C) or above 423K (150 C).*

2A225 *Crucibles made of materials resistant to liquid actinide metals.*

2A226 *Valves not controlled by 0B001 that are 5mm (0.2in.) or greater in nominal size, with a bellows seal, wholly made of or lined with aluminum, aluminum alloy, nickel, or alloy containing 60% or more nickel, either manually or automatically operated.*

2A290	*Generators and other equipment specially designed, prepared, or intended for use with nuclear plants.*
2A291	*Equipment related to nuclear material handling and processing and to nuclear reactors.*
2A292	*Piping, fittings, and valves made of, or lined with, stainless steel, copper-nickel alloy or other alloy steel containing 10% or more nickel and/or chromium.*
2A293	*Pumps designed to move molten metals by electromagnetic forces.*
2A993	*Explosive detection systems, consisting of an automated device, or combination of devices, with the ability to detect the presence of different types of explosives, in passenger checked baggage, without need for human skill, vigilance, or judgement.*
2A994	*Portable electric generators and specially designed parts.*
2B001	*"Numerical control" units, "motion control boards", specially designed for "numerical control" applications on machine tools, machine tools, and specially designed components therefor.*
2B002	*Non-"numerically controlled" machine tools for generating optical quality surfaces.*
2B003	*"Numerically controlled" or manual machine tools specially designed for cutting, finishing, grinding or honing either of the following classes of bevel or parallel axis hardened (R_c=40 or more) gears, and specially designed components, controls and accessories therefor.*
2B004	*Hot "isostatic presses" and specially designed dies, molds, components, accessories and controls therefor.*
2B005	*Equipment specially designed for deposition, processing and in-process control of inorganic overlays, coatings and surface modification, , for non-electric substrates, by processes shown in the Table and associated Notes following 2E003.d, and specially designed automated handling, positioning, manipulation and control components therefor.*
2B006	*Dimensional inspection or measuring system or equipment.*
2B007	*"Robots", and specially designed controllers and "end-effectors" therefor.*
2B008	*Assemblies, units or inserts specially designed or machine tools, or for equipment controlled by 2B006 or 2B007.*
2B009	*Specially designed printed circuit boards with mounted components, or "compound rotary tables" or "tilting spindles", capable of upgrading, according to the manufacturer's specifications, "numerical control" units, machine tools or feed-back devices to or above the levels specified in ECCNs 2B001, 2B002, 2B003, 2B004, 2B005, 2B006, 2B007, or 2B008.*
2B018	*Equipment on the International Munitions List.*
2B104	*Equipment and process controls designed or modified for densification and pyrolysis of structural composite rocket nozzles and reentry vehicle nose tips.*
2B115	*Flow forming machines, and specially designed components therefor.*
2B116	*Vibration test systems, equipment, and components therefor.*

2B204 ***"Isostatic presses", not controlled by 2B004 or 2B104, capable of achieving a maximum working pressure of 10,000 psi (69MPa) or greater and having chamber cavity with an inside diameter in excess of 152mm (6 inches) and specially designed dies, molds, and controls therefor.***

2B207 ***"Robots", and "end-effectors", other than those controlled by 2B007, specially designed to comply with safety standards applicable to handling explosives (i.e., meeting electrical code ratings for high explosives) and specially designed controllers therefor.***

2B215 ***Flow-forming and spin-forming machines other than those controlled by 2B115, and rotor-forming mandrels.***

2B225 ***Remote manipulators that can be used to provide remote actions in radiochemical separation operations and hot cells.***

2B226 ***Vacuum and controlled environment (inert gas induction) furnaces capable of operating above 1,123K (850 C) and having induction coils 600mm or less in diameter and designed for power inputs of 5 kW or more, and power supplies specially designed therefor with a specified power output of 5kW or more.***

2B227 ***Vacuum and controlled atmosphere metallurgical melting and casting furnaces, and specially configured computer control and monitoring systems therefor.***

2B228 ***Rotor fabrication and assembly equipment and bellows-forming mandrels and dies.***

2B229 ***Centrifugal balancing machines, fixed or portable, horizontal or vertical.***

2B230 ***Pressure transducers which are capable of measuring absolute pressure at any point in the range 0 to 13kPa, with pressure sensing elements made of or protected by nickel, nickel alloys with more than 60% nickel by weight, aluminum or aluminum alloys.***

2B231 ***Vacuum pumps with an input throat size of 38cm (15in.) or greater with a pumping speed of 15,000 liters/second or greater and capable of producing an ultimate vacuum better than 10^{-4} Torr (1.33×10^{-4} mbar).***

2B232 ***Multistage light gas guns of other high-velocity gas systems (coil, electromagnetic, electrothermal, or other advanced systems) capable of accelerating projectiles to 2km/s or greater and specialized components therefor.***

2B290 ***"Numerically controlled" machine tools not controlled by 2B001.***

2B350 ***Chemical manufacturing facilities and equipment.***

2B351 ***Toxic gas monitoring system; and dedicated detectors therefor.***

2B352 ***Biological equipment.***

2B985 ***Equipment specially designed for manufacturing shotgun shells; and ammunition hand-loading equipment for both cartridges and shotgun shells.***

2B991 ***Numerical control units for machine tools and "numerically controlled" machine tools, n.e.s.***

2B992 ***Manual dimensional inspection machines with two or more axes, and measurement uncertainty equal to or less (better) than (3+L/300) micrometer in any axes (L measured length in mm).***

2B993 *Gearmaking and/or finishing machinery not controlled by 2B003 capable of producing gears to a quality level of better than AGMA 11.*

2B994 *“Robots” not controlled by 2B007or 2B207 that are capable of employing feedback information in real-time processing from one or more sensors to generate of modify “programs” or to generate or modify numerical program data.*

2D001 *“Software” specially designed or modified for the “development”, “production” or “use” of equipment controlled by 2A001 to 2A007 or 2B001 to 2B009.*

2D002 *Specific “software”.*

2D018 *“Software” for the “development”, “production” or “use” of equipment controlled by 2B018.*

2D101 *“Software” for the “development”, “production”, or “use” of items controlled by 2B104, 2B115 or 2B116.*

2D290 *“Software” specially designed or modified for the “development”, “production” or “use” of items controlled by 2A290, 2A291 or 2B290.*

2D992 *“Software” specially designed for the “development” or “production” of equipment controlled by 2B992.*

2D993 *“Software” specially designed for the “development”, “production”, or “use” of equipment controlled by 2B991, 2B993, or 2B994.*

2D994 *“Software” specially designed for the “development” or “production” of portable electric generators controlled by 2A994.*

2E001 *“Technology" according top the General Technology Note for the “development” of items controlled by 2A (except 2A993 and 2A994) or 2B (except 2B018, 2B991 to 2B994) 2D (except 2D018, 2D992 to 2D994).*

2E002 *“Technology” according to the General Technology Note for the “production” of items controlled by 2A (except 2A993 and 2A994) or 2B (except 2B018, 2B991 to 2B994).*

2E003 *Other “Technology”.*

2E201 *“Technology” according to the General Technology Note for the “use” of items or “software” controlled by 2A225, 2A226, 2B001, 2B006, 2B007, 2B204, 2B207, 2B215, 2B225 to 2B232 or 2D201 for NP reasons.*

2E993 *“Technology” for the "use" of equipment controlled by 2B991, 2B992, 2B993, or 2B994.*

2E994 *“Technology” for the “use" of portable electric generators controlled by 2A994.*

CATEGORY 3 ELECTRONICS DESIGN, DEVELOPMENT AND PRODUCTION

3A001 *Electronic devices and components.*

3A002 *General purpose electronic equipment.*

3A101 *Electronic equipment, devices and components, other than those specified in 3A001.*

3A201 *Electronic components, other than those specified in 3A001.*

3A202 *Oscilloscopes and transient recorders other than those controlled by 3A002.a.5, and specially designed components therefor.*

3A225 *Frequency changers (also known as converters or inverters) or generators, having all of the following characteristics.*

3A226 *Direct current high-power supplies capable of continuously producing, over a time period of 8 hours, 100V or greater with a current output of 500A or greater and with a current or voltage regulation better than 0.1%.*

3A227 *High-voltage direct current power supplies capable of continuously producing, over a time period of 8 hours, 20,000V or greater with a current output of 1A or greater and with a current or voltage regulation better than 0.1%.*

3A228 *Switching devices.*

3A229 *Firing sets and equivalent high-current pulse generators (for detonators controlled by 3A232.*

3A230 *High-speed pulse generators with output voltages greater than 6 Volts into a less than 55 ohm resistive load, and with pulse transition times less than 500 picoseconds (defined as the time interval between 10% and 90% voltage amplitude).*

3A231 *Neutron generator systems, including tubes, designed for operation without an external vacuum system, and utilizing electrostatic acceleration to induce a tritium-deuterium nuclear reaction.*

3A232 *Detonators and multipoint initiation systems (exploding bridge wire, slapper, etc).*

3A233 *Mass spectrometers capable of measuring ions of 230 atomic mass units or greater and having a resolution of better than 2 parts in 230, and ion sources therefor.*

3A980 *Voice print identification and analysis equipment and parts, n.e.s.*

3A981 *Polygraphs (except biomedical recorders designed for use in medical facilities for monitoring biological and neurophysical responses); fingerprint analyzers, cameras and equipment, n.e.s.; automatic fingerprint and identification retrieval systems, n.e.s.; psychological stress analysis equipment; electronic monitoring restraint devices; and specially designed parts and accessories, n.e.s.*

3A992 *Electronic devices and components not controlled by 3A001.*

3A993 *Electronic test equipment in Category 3A n.e.s.*

3A994 *General purpose electronic equipment not controlled by 3A002.*

3B001 *“Store program controlled” equipment for epitaxial growth.*

3B002 *“Stored program controlled” equipment designed for ion implantation, having the following characteristics.*

3B003 *“Stored program controlled” anisotropic plasma dry etching equipment.*

3B004	*“Stored program controlled” plasma enhanced CVD equipment.*
3B005	*“Stored program controlled" automatic loading multi-chamber central wafer handling systems, having interfaces for wafer input and output, to which more than two pieces of semiconductor processing equipment are to be connected, to form as integrated system in a vacuum environment for sequential multiple wafer processing.*
3B006	*“Stored program controlled” lithography equipment.*
3B007	*Masks or reticles.*
3B008	*“Stored program controlled” test equipment, specially designed for testing semiconductor devises and unencapsulated dice.*
3B991	*Equipment not controlled by 3B001 for the manufacture or testing of electronic components and materials, and specially designed components and accessories therefor.*
3C001	*Hetero-epitaxial materials consisting of a “substrate” with stacked epitaxially grown multiple layers.*
3C002	*Resist materials, and “substrates” coated with controlled resists.*
3C003	*Organic-inorganic compounds.*
3C004	*Hydrides of phosphorous, arsenic or antimony, having a purity better than 99.999%, even diluted in inert gases or hydrogen.*
3D001	*“Software” specially designed for the “development” or “production” of equipment controlled by 3A001.a.1.a, 3A001.b to 3A001.f, 3A002, 3A101 or 3B (except 3B991).*
3D002	*“Software” specially designed for the “use” of "stored program controlled” items controlled by 3B (except 3B991).*
3D003	*Computer-aided-design (CAD) “software” for semiconductor devices or integrated circuits, having any of the following.*
3D101	*“Software” specially designed for the “use” of items controlled by 3A101.b.*
3D980	*“Software” specially designed for the “development”, “production” or “use” of items controlled by 3A980 and 3A981.*
3D994	*“Software” specially designed for the “development”, “production”, or “use” of electronic devices or components controlled by 3A992, electronic test equipment controlled by 3A993, general purpose electronic equipment controlled by 3A994, or manufacturing and test equipment controlled by 3B991.*
3E001	*“Technology” according to the /general Technology Note for the “development” or “production” of items controlled by 3A (except 3A980, 3A981, and 3A992 to 3A994), 3B (except 3B991) or 3C.*
3E002	*Other “technology” for the “development” or “production” of times described in this entry.*
3E101	*“Technology” according to the General Technology Note for the “use” of equipment controlled by 3A001.a.1.a or 3A101.*

3E201 *"Technology" according to the General Technology Note for the "use" of items controlled by 3A001.e.2, e.3, and e.5, 3A201, 3A202, 3A225 to 3A233.*

3E980 *"Technology" specially designed for "development", "production", or "use" of items controlled by 3A980 and 3A981.*

3E994 *"Technology" for the "development", "production", or "use" of electronic devices or components controlled by 3A992, electronic test equipment controlled by 3A993, general purpose electronic equipment controlled by 3A994, or manufacturing and test equipment controlled by 3B991.*

CATEGORY 4 COMPUTERS

4A001 *Electronic computers and related equipment, and "electronic assemblies" and specially designed components therefor.*

4A002 *"Hybrid computers", and "electronic assemblies" and specially designed components therefor.*

4A003 *"Digital computers", "electronic assemblies", and related equipment therefor, and specially designed components therefor.*

4A101 *Analog computers, "digital computers", or digital differential analyzers, other than those controlled by 4A001.a.1, designed or modified for use in missiles, having either of the following characteristics.*

4A980 *Computers for fingerprints equipment, n.e.s.*

4A994 *Computers, "electronic assemblies", and related equipment not controlled by 4A001, 4A002, or 4A003, and specially designed components therefor.*

4B994 *Equipment for the "development" and "production" of magnetic and optical storage equipment.*

4C994 *Materials specially formulated for and required for the fabrication of head/disk assemblies for controlled magnetic and magneto-optical hard disk drives.*

4D001 *"Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 4A001 to 4A004, 4A101, or "software" controlled by 4D001 to 4D003.*

4D002 *"Software" specially designed or modified to support "technology" controlled by 4E001 to 4E002.*

4D003 *Specific "software", as described in this entry.*

4D980 *"Software" specially designed for the "development" "production", or "use" of items controlled by 4A980.*

4D993 *"Program" proof and validation "software", "software" allowing the automatic generation of "source codes", and operating systems not controlled by 4D003 that are specially designed for real time processing equipment.*

4D994 *"Software" specially designed or modified for the "development", "production", or "use" of equipment controlled by 4A994, 4B994 and materials controlled by 4C994.*

4E001 *"Technology" according to the General Technology Note, for the "development", "production" or "use" of equipment controlled by 4A001 to 4A004, 4A101 or "software" controlled by 4D (except 4A980, 4A993 or 4A994).*

4E002 *Other "technology".*

4E980 *"Technology" for the "development", "production", or "use" of items controlled by 4A980.*

4E992 *"Technology" for the "development", "production", or "use" of equipment controlled by 4A994 and 4B994, materials controlled by 4C994, or "software" controlled by 4D993, or 4D994.*

4E993 *"Technology" for the "development" or "production" of graphic accelerators or equipment designed for "multi-data-stream processing" and "technology" "required" for the "development" or "production" of magnetic hard disk drives.*

CATEGORY 5 TELECOMMUNICATION AND INFORMATION SECURITY

5A001 *Any type of telecommunications equipment having any of the following characteristics, functions or features:*

5A101 *Telemetering and telecontrol equipment usable for "missiles".*

5A980 *Communications intercepting devices; and parts and accessories therefor.*

5A990 *Any type of telecommunications equipment, not controlled by 5A001.a, specially designed to operate outside the temperature range from 219K (-54 C) to 397K (124 C).*

5A991 *Transmission equipment, and not controlled by 5A001.b.*

5A992 *Mobile communications equipment, n.e.s., and assemblies and components therefor.*

5A993 *Radio relay communications equipment designed for use at frequencies equal to or exceeding 19.7 Ghz and assemblies and components therefor, n.e.s.*

5A994 *"Data (massage) switching" equipment or systems designed for "packet-mode operation" and assemblies and components therefor, n.e.s.*

5B001 *Equipment, and specially designed components and accessories therefor.*

5B994 *Telecommunications test equipment, n.e.s.*

5C001 *Preforms of glass or of any other material optimized for the manufacture of optical fibers controlled by 5A001.e.*

5D001: *Telecommunication "Software".*

5D101 *"Software" designed or modified for the "development", "production" or "use" of items controlled by 5A101.*

5D990 *"Software" specially designed or modified for the "development", "production", or "use" of equipment controlled by 5A990 and 5A991.*

5D991 *"Software" specially designed or modified for the "development", "production", or "use" of telecommunications test equipment controlled by 5B994.*

5D992 *"Software" specially designed or modified for the "development", "production" or "use" of mobile communications equipment controlled by 5A992.*

5D994 *"Software" specially designed or modified for the "development", "production" or "use" of data (message) switching equipment controlled by 5A994.*

5E001 *Telecommunications "technology".*

5E101 *"Technology" according to the General Technology Note for the "development", "production" or "use" of equipment controlled by 5A101 or "software" controlled by 5D101.*

5E990 *"Technology" for the "development", "production" or "use" of equipment controlled by 5A990 or 5A991 or "software" controlled by 5D990.*

5E991 *"Technology" for the 'development", "production", or "use" of telecommunications test equipment controlled by 5B994, or "software" controlled by 5D991.*

5E992 *"Technology" for the "development", "production", or "use" of mobile communications equipment controlled by 5A992 of "software" controlled by 5D992.*

5E993 *"Technology" for the "development", "production", or "use" of radio relay communication equipment controlled by 5A993, or "software" controlled by 5D993.*

5E994 *"Technology" for the "development", "production" or "use"of data (message) switching equipment controlled by 5A994, or "software" controlled by 5D994.*

5A002: *Systems, equipment, application specific "electronic assemblies", modules of integrated circuits for "information security", and specially designed components therefor.*

5A995: *"Information security" equipment, n.e.s., (e.g., cryptographic, cryptanalytic, and cryptologic equipment, n.e.s.), and components therefor.*

5B002 *Information Security - test, inspection and "production" equipment.*

5D002 *Information Security - "Software".*

5D995 *"Software", n.e.s., specially designed or modified for the "development", "production", or use of information security or cryptologic equipment (e.g., equipment controlled by 5A995).*

5E002 *"Technology" according to the General Technology Note for the "development", "production" or use of equipment controlled by 5A002 or 5B002 or "software" controlled by 5D002.*

5E995 *"Technology", n.e.s., for the "development", "production", or "use" of "information security" or cryptologic equipment (e.g., equipment controlled by 5A995), or software controlled by 5D995.*

CATEGORY 6 SENSORS

6A001 *Acoustics.*

6A002 ***Optical sensors.***

6A003 ***Cameras.***

6A004 ***Optics.***

6A005 ***Lasers, components and optical equipment.***

6A006 ***"Magnetometers", "magnetic gradiometers", "intrinsic magnetic gradiometers" and compensation systems and specially designed components.***

6A007 ***Gravity meters (gravimeters) and gravity gradiometers.***

6A008 ***Radar systems, equipment and assemblies and specially designed components therefor.***

6A018 ***Magnetic, pressure, and acoustic underwater detection devices specially designed for military purposes and controls and components therefor.***

6A102 ***Radiation hardened detectors, other than those specified in 6A002, for use in protecting against nuclear effects (e.g., electromagnetic pulse (EMP), X-rays, combined blast and thermal effects) and usable for "missile", designed or rated to withstand radiation levels which meet or exceed a total irradiation dose of $5x10^5$ rads (Si).***

6A107 ***Specially designed components for gravity meters and gravity gradiometers specified in 6A007.b and c.***

6A108 ***Radar systems and tracking systems, other than those controlled by 6A008.***

6A202 ***Photomultiplier tubes with a photocathode area of greater than $20cm^2$ having an anode pulse rise time of less than 1ns.***

6A203 ***Cameras and components not controlled by ECCN 6A003.***

6A205 ***Laser, other than those specific in 6A005.***

6A225 ***Velocity interferometers for measuring velocities in excess of 1km per second during time intervals less than 10 microseconds (e.g. VISAR's, Doppler laser interferometers, DLI's, etc.);***

6A990 ***Airborne radar equipment, n.e.s., and specially designed components therefor.***

6A992 ***Gravity meters (gravimeters) for ground use, n.e.s.***

6A993 ***"Magnetometers", n.e.s., having a "noise level" (sensitivity) lower (better) than 1.0nT rms per square root Hz.***

6A994 ***Marine or terrestrial acoustic equipment, n.e.s., capable of detecting or locating underwater objects or features or positioning surface vessels or underwater vehicles; and specially designed components, n.e.s.***

6B004 ***Optics.***

6B005 ***Specially designed or modified equipment, including tools, dies, fixtures or gauges, and other specially designed components and accessories therefor.***

6B007 *Equipment to produce, align and calibrate land-based gravity meters with a static accuracy of better than 0.1 milligal.*

6B008 *Pulse radar cross-section measurement systems having transmit pulse widths of 100ns or less and specially designed components therefor.*

6B108 *Systems specially designed for radar cross section measurement usable for "missiles" and their subsystems.*

6C002 *Optical sensors.*

6C004 *Optics.*

6C005 *Synthetic crystalline "laser" host material in unfinished form.*

6D001 *"Software" specially designed for the "development" or "production" of equipment controlled by 6A002, 6A003, 6A004, 6A005, 6A007, 6A008, 6A102, 6A108, 6B008 or 6B108.*

6D002 *"Software" specially designed for the "use" of equipment controlled by 6A002.b, 6A008, or 6B008.*

6D003 *Other "software".*

6D102 *"Software" specially designed for the "use" of equipment controlled by 6A002, 6A003, 6A007, 6A102, 6A108 or 6B108.*

6D103 *"Software"that processes post-flight recorded data obtained from systems controlled by 6A108.b, enabling determination of vehicle position through its flight path.*

6D990 *"Software" specially designed for the "development", "production", or "use" of equipment controlled by 6A990, 6A992, or 6A993.*

6D994 *"Software" specially designed for the "development", "production", or "use" of equipment controlled by 6A994.*

6E001 *"Technology" according to the General Technology Note for the "development" of equipment, materials or "software" controlled by 6A (except 6A018, 6A990, 6A992 to 6A994), 6B, 6C, or 6D (except 6D990 or 6D994).*

6E002 *"Technology" according to the General Technology Note for the "production" of equipment or materials controlled by 6A (except 6A018, 6A990, 6A992 to 6A994), 6B, or 6C.*

6E003 *Other "technology".*

6E101 *"Technology" according to the General Technology Note for the "use" of equipment or "software" controlled in 6A002.a.1, a.3 and a.4, 6A007.b and .c, 6A008, 6A102, 6A107, 6A108, 6B108, 6D001, 6D002, 6D102 or 6D103 for MT reasons.*

6E201 *"Technology" for the "use" of equipment controlled by 6A003, 6A005, 6A202, 6A203, 6A205, 6A225, or 6A226 for NP reasons.*

6E990 *"Technology" for the "development", "production" of "use" equipment controlled by 6A990, 6A992, or 6A993.*

6E994 *"Technology" for the "development", "production", or "use" of equipment controlled by 6A994.*

CATEGORY 7 NAVIGATION AND AVIONICS

7A001 *Accelerometers designed for use in inertial navigation or guidance systems and having any of the following characteristics, and specially designed components therefor.*

7A002 *Gyros having any of the following characteristics, and specially designed components therefor.*

7A003 *Inertial navigation systems (gimballed and strapdown) and inertial equipment for attitude, guidance or control, having any of the following characteristics, and specially designed components therefor.*

7A004 *Gyro-astro compasses, and other devices that derive position or orientation by means of automatically tracking celestial bodies or satellites, with azimuth accuracy of equal to or less (better) than 5 seconds of arc; and specially designed components therefor.*

7A006 *Airborne altimeters operating at frequencies other than 4.2 to 4.4GHz inclusive, having either of the following characteristics, and specially designed components therefor.*

7A101 *Accelerometers, other than those specified in entry 7A001, with a threshold of 0.05G or less, or a linearity error within 0.25% of full scale output, or both, that are designed for use in inertial navigation systems or in guidance systems of all types and specially designed components therefor.*

7A102 *All types of gyros, other than those specified in 7A002, usable in "missiles", with a rated "drift rate" "stability" of less than 0.5 (1 sigma or rms) per hour in a 1g environment and specially designed components therefor.*

7A103 *Instrumentation, navigation equipment and systems, other than those specified in 7A003, and specially designed components therefor.*

7A104 *Gyro-astro compasses and other devices, other than those specified in 7A004, that derive position or orientation by means of automatically tracking celestial bodies or satellites and specially designed components therefor.*

7A106 *Avionics equipment and components usable in missile systems.*

7A115 *Airborne passive sensors for determining bearing to specific electromagnetic sources (direction finding equipment) of terrain characteristics.*

7A994 *Other navigation direction finding equipment, airborne communication equipment, all aircraft, inertial navigation systems not controlled under 7A003 or 7A103, and other avionic equipment, including parts and components, n.e.s.*

7B001 *Test, calibration or alignment equipment specially designed for equipment controlled by 7A, except equipment for Maintenance Level I or Maintenance Level II.*

7B002 *Equipment specially designed to characterize mirrors for ring "laser" gyros.*

7B003 *Equipment specially designed for the "production" of equipment controlled by 7A, and specially designed components therefor.*

7B101 ***Equipment specially designed for the "production" of equipment controlled by 7A, and specially designed components therefor.***

7B102 ***Reflectometers specially designed to characterize mirrors, for "laser" gyros, having a measurement accuracy of 50ppm or less (better).***

7B994 ***Other equipment for the test, inspection, or "production" of navigation and avionics equipment.***

7D001 ***"Software" specially designed or modified for the "development" or "production" of equipment controlled by 7A (except 7A994) or 7B (except 7B994).***

7D002 ***"Source code" for the "use" of any inertial navigation equipment or Attitude Heading Reference Systems (AHRS) (except gimballed AHRS) including inertial equipment not controlled by 7A003 or 7A004.***

7D003 ***Other "software".***

7D101 ***"Software" specially designed for the "use" of equipment controlled by 7A001 to 7A004, 7A006, 7A101 to 7A104, 7A106, 7A115, 7B001, 7B002, 7B003, 7B101, or 7B102.***

7D102 ***Integration "software" for the equipment controlled by 7A003 or 7A103.***

7D994 ***"Software", n.e.s., for the "development", "production", or "use" of navigation, airborne communication and other avionics.***

7E001 ***"Technology" according to the General Technology Note for the "deve;opment" pf equipment or "software" controlled by 7A (except 7A994), 7B (except 7B994), or 7D (except 7D994).***

7E002 ***"Technology" according to the General Technology Note for the "production" of equipment controlled by 7A (except 7A994) or 7B (except 7B994).***

7E003 ***"Technology" according to the General Technology Note for the repair, refurbishing or overhaul of equipment controlled by 7A001 to 7A004, except for maintenace "technology" directly associated with calibration, removal or replacement of damaged or unserviceable line replaceable units (LRU) and shop replaceable units (SRU) of a "civil aircraft" as described in Maintenance Level I or Maintenance Level II.***

7E004 ***Other "technology".***

7E101 ***"Technology" according to the General Technology Note for the "use" of euipment or "software" specified in 7A001 to 7A004, 7A006, 7A101 to 7A104, 7A106, 7A115, 7B002, 7B003, 7B101, 7B102, 7D101 or 7D102 for MT reasons.***

7E102 ***"Technology" for protection of avionics and electrical subsystems against electromagnetic pulse (EMP) and electromagnetic interference (EMI) hazards from external sources.***

7E994 ***"Technology", n.e.s., for the "development", "production", of "use" of navigation, airborne communication, and other avionics equipment.***

CATEGORY 8 MARINE

8A001 ***Submersible vehicles or surface vessels.***

8A002 ***Systems or equipment.***

8A018 ***Items on the International Munitions List.***

8A992 ***Other underwater camera equipment, n.e.s., other submersible systems, n.e.s.; and specially designed parts therefor.***

8A993 ***Self-contained underwater breathing apparatus (scuba gear) and related equipment.***

8A994 ***Boats, n.e.s., including inflatable boats, marine engines (both inboard and outboard) and submarine engines, n.e.s.; and specially designed parts therefor, n.e.s.***

8B001 ***Water tunnels, having a background noise of less than 100dB (reference 1 microPascal, 1 Hz) in the frequency range from 0 to500 HZ, designed for measuring acoustic fields generated by a hydro-flow around propulsion system models.***

8C001 ***Syntactic foam for underwater use.***

8D001 ***"Software" specially designed or modified for the "development", "production" or "use" of equipment or materials controlled by 8A (except 8A018, 8A992 to 8A994), 8B, or 8C.***

8D002 ***Specific "software" specially designed or modified for the "development" "production", repair, overhaul or refurbishing (re-machining) of propellers specially designed for underwater noise reduction.***

8D992 ***"Software" specially designed or modified for the "development", "production" or "use" or equipment controlled by 8A992.***

8D993 ***"Software" specially designed or modified for the "development", "production" or "use" of equipment controlled by 8A993 and 8A994.***

8E001 ***"Technology" according to the General Technology Note for the "development" or "production" of equipment or materials controlled by 8A (except 8A018, 8A992 to 8A994), 8B, or 8C.***

8E002 ***Other technology.***

8E992 ***"Technology" for the "development", "production" or "use' of equipment controlled by 8A992.***

8E993 ***"Technology" for the "development", "production" or "use" of items controlled by 8A993 and 8A994.***

CATEGORY 9 PROPULSION SYSTEMS, SPACE VEHICLES AND RELATED EQUIPMENT

9A001 ***Aero gas turbine engines incorporating any of the technologies controlled by 9E003.a and described in this entry.***

9A002 ***Marine gas turbine engines with an ISO standard continuous power rating of 24,245kW or more and a specific fuel consumption of less than 0.210 kg/kWh at any point in the power range from 35 to 100%, and specially designed assemblies and components therefor.***

9A003 ***Specially designed assemblies and components, incorporating any of the technologies controlled by 9E003.a, for gas turbine engine propulsion systems.***

9A004 ***"Spacecraft" (not including their payloads), and specially designed components therefor that are not subject to the authority of the Department of State.***

9A918 ***Equipment on the International Munitions List.***

9A101 ***Lightweight turbojet and turbofan engines (including turbocompound engines) usable in "missile", other than those specified in 9A001, having both the following characteristics;***

9A106 ***Systems or components, other than those controlled by 9A006, usable in "missiles", as follows, specially designed for liquid rocket propulsion systems.***

9A110 ***Composite structures, laminates, and manufactures thereof, and resin impregnated fiber prepregs and metal coated fiber preforms, therefor, made either with organic matrix or metal matrix utilizing fibrous or filamentary reinforcements having a specific tensile strength greater than 7.62×10^4m (3×10^6 inched) and specific modulus greater than 3.18×10^6m (1.25×10^8inches).***

9A115 ***Launch support equipment designed or modified for systems controlled by 9A004 or 9A104.***

9A190 ***Non-military unmanned air vehicle systems (UAVs) and remotely piloted vehicles (RPVs) that are capable of a maximum range of at least 300 kilograms (km), regardless of payload,***

9A980 ***Non-military mobile crime science laboratories; and parts and accessories, n.e.s.***

9A990 ***Diesel engines, n.e.s, for trucks, tractors, and automotive applications of continuous brake horsepower of 400 BHP (298kW) or greater (performance based on SAE J1349 standard conditions of 100kPa and 25); pressurized aircraft breathing equipment, n.e.s.; and specially designed parts therefor, n.e.s.***

9A991 ***"Aircraft" and certain gas turbine engines, n.e.s.***

9A992 ***Off highway wheel tractors of carriage capacity 9mt (20,000lbs) or more; and parts and accessories, n.e.s.***

9A993 ***On highway tractors, with single of tandem rear axles rated for 9mt per axle (20,000lbs.) or greater and specially designed parts.***

9A994 ***Aircraft parts and components, n.e.s.***

9B001 ***Specially designed equipment, tooling ior fictures, as follows, for manufacturing or measuring gas turbine blades, vanes or tip shroud castings.***

9B002 ***On-line (real-time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, specially designed for the development of gas turbine engines, assemblies or components incorporating technologies controlled by 9E003,a.***

9B003 ***Equipment specially designed for the production or test of gas turbine brush seals designed to operate at tip speeds exceeding 335 m/s, and specially designed parts or accessories.***

9B004 ***Tools, dies or fixtures for the solid state joining of gas turbine "superalloy" or titanium components.***

9B005 *On-line (real-time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, specially designed for use with wind tunnels or devices.*

9B006 *Specially designed acoustic vibration test equipment capable of producing sound pressure levels of 160dB or more, (reference to 20 micropascals) with a rated output of 4 kW or more at a test cell temperature exceeding 1273K (1000 C), and specially designed transducers, strain gauges, accelerometers, thermocouples or quartz heaters therefor.*

9B007 *Equipment specially designed for inspecting the integrity of rocket motors using non-destructive test (NDT) techniques other than planar X-ray or basic physical or chemical analysis.*

9B008 *Transducers specially designed for the direct measurement of the wall skin friction of the test flow wotha stagnation temperature exceeding 833K (560 C).*

9B009 *Tooling specially designed for producing turbine engine powder metallurgy rotor components capable of operating at stress levels of 60% of ultimate tensile strength (UTS) or more and metal temperatures of 873K (600 C) or more.*

9B105 *Wind tunnels for speeds of Mach 0.9 or more usable for "missiles" and their subsystems.*

9B106 *Environmental chambers and anechoic chambers.*

9B115 *Specially designed "production equipment" for the systems, sub-systems, and components controlled by 9A004 to 9A009, 9A011, 9A101, 9A104 to 9A109, 9A111, 9A116 to 9A119.*

9B116 *Specially designed "production facilities" for the systems, sub-systems, and components controlled by 9A004 to 9A009, 9A011, 9A101, 9A104 to 9A109, 9A111, 9A116 to 9A119.*

9B117 *Test benches and test stands for solid or liquid propellant rockets or rocket motors, having either of the following characteristics.*

9B994 *Vibration test equipment and specially designed parts and components, n.e.s.*

9D001 *"Software" "required" for the "development" of equipment or "technology" controlled by 9A (except 9A018, 9A990 to 9A994), 9B (except 9B994) or 9E003.*

9D002 *"Software" "required" for the "production" of equipment controlled by 9A (except 9A018, 9A990 to 9A994) or 9B (except 9B994a).*

9D003 *"Software" "required" for the "use" of full authority digital electronic engine controls (FADEC) for propulsion systems controlled by 9A (except 9A990, 9A990 to 9A994) or 9B (except 9B994).*

9D004 *Other "software".*

9D101 *"Software" specially designed for the "use" of items sspecified in 9A101, 9A106, 9A110, 9A115, 9A190, 9B105, 9B106, 9B116 or 9B117.*

9D018 *"Software" for the "use" of equipment controlled by 9A018.*

9D990 *"Software", n.e.s., for the "development" or "production" of diesel engines and pressurized aircraft breathing equipment controlled by 9A990.*

9D991	*"Software", n.e.s., for the "development: or "production" of aircraft and aero gas turbine engines controlled by 9A991 or aircraft parts and components controlled by 9A994.*
9D993	*"Software" for the "production" or "development" of off-highway wheel tractors controlled by 9A992 or on-highway tractors controlled by 9A993.*
9E001	*"Technology" according to the General Technology Note for the "development" of equipment or "software" controlled by 9A001.c, 9B (except 9B994), or 9D (except 9D018, 9D990 to 9D994).*
9E002	*"Technology" according to the General Technology Note for the "production" of equipment controlled by 9A001.c or 9B (except 9B994).*
9E003	*Other "technology"*
9E018	*"Technology" for the "development", "production", or "use" of equipment controlled by 9A018.*
9E101	*"Technology" according toi the General Technology Note for the "development" or "production" of equipment controlled by 9A101, 9A106, 9A110, or 9A115.*
9E102	*"Technology" according to the General Technology Note for the "use" of goods specified in 9A101, 9A106, 9A110, 9B105, 9B106, 9B115, 9B116, 9B117, or 9D101.*
9E990	*"Technology", n.e.s., for the "development", "production", or "use" of diesel engines and pressurized aircraft breathing equipment controlled by 9A990.*
9E991	*"Technology", n.e.s., for the "development", "production", or "use" of aircraft and aero gas turbine engines controlled by 9A991 or aircraft parts and components controlled by 9A994.*
9E993	*"Technology" for the "development", "production", or "use" of off-highway wheel tractors controlled by 9A992 or on-highway tractors controlled by 9A993.*
9E994	*"Technology" for "development", "production", or "use" of vibration test equipment controlled by 9B994.*
EAR99	*Items subject to the EAR that are not elsewhere specified in this CCL Category or in any other category in the CCL, are designed by the number EAR99.*